

**CLAIMS**

1. A method of diversity error control coding for a system having variable-length packets that carry prioritized data, comprising the steps of:

5 replicating high priority packets in a data sequence to form virtual replications;  
and

generating parity symbols from the data sequence and from the virtual replications and generating tag information that indicates a number of the virtual replications used to generate the parity symbols, for subsequent transmission of only  
10 the data sequence, the parity symbols, and the tag information to reconstruct the data sequence.

2. The method of claim 1, further comprising the step of transmitting, without the virtual replications, only the data sequence, the parity symbols, and the  
15 tag information, for subsequent reconstruction of the data sequence.

3. A method of diversity error control decoding for a system having variable-length packets that carry prioritized data, comprising the steps of:

receiving data packets, parity packets, and tag information, the parity packets  
20 having parity symbols generated from both the data packets and from replications of high priority ones of the data packets, and the tag information for indicating a number of the replications used to generate the parity symbols; and

reconstructing the data sequence from the received the data packets, the parity symbols, and the tag information, without any one of a transmission and receipt  
25 of the replications.

4. The method of claim 3, wherein said reconstructing step comprises the step of reconstructing the replications from the tag information and the parity symbols without ever actually receiving the replications.

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5. The method of claim 3, wherein said reconstructing step comprises the steps of:

arranging the packets vertically to form columns of symbols; and  
applying at least one codeword to each of the columns of symbols.

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6. The method of claim 5, wherein for a packet that spans at least one of the columns and that has an error therein, said reconstructing step comprises the steps of:

recovering at least one symbol corresponding to the error using the parity  
15 symbols;

substituting the at least one symbol into at least one other of the columns to  
recover at least one other symbol.

7. The method of claim 5, wherein said reconstructing step comprises the  
20 steps of:

recovering a packet in at least one of the columns, the packet having an error  
therein; and

substituting at least one symbol corresponding to the recovered packet for at  
least one other symbol in at least another one of the columns to recover at least  
25 another packet.

8. An apparatus for diversity error control coding in a system having variable-length packets that carry prioritized data, comprising:

5 a replicator for replicating high priority packets in a data sequence to form virtual replications;

a parity symbol generator for generating parity symbols from the data sequence and the virtual replications; and

a tag information generator for generating tag information that indicates a number of the virtual replications used to generate the parity symbols;

10 wherein only the data sequence, the parity symbols, and the tag information are subsequently transmitted to reconstruct the data sequence.

9. The apparatus of claim 8, further comprising a transmitter for transmitting, without the virtual replications, only the data sequence, the parity symbols, and the tag information, for subsequent reconstruction of the data sequence from only the data sequence, the parity symbols, and the tag information.

10. An apparatus for diversity error control coding in a system having variable-length packets that carry prioritized data, comprising:

20 a decoder for receiving a data sequence that includes data packets, parity packets, and tag information, the parity packets having parity symbols generated from both the data packets and from replications of high priority ones of the data packets, and the tag information for indicating a number of the replications used to generate the parity symbols,

wherein said decoder reconstructs data symbols in the data packets without any receipt of the replications, and using at least the parity bits and the tag information.

5           11.    The apparatus of claim 10, wherein said decoder reconstructs the data symbols by at least reconstructing the replications from the tag information and the parity symbols without ever actually receiving the replications.

10           12.    The apparatus of claim 10, further comprising a receiver for initially receiving the data sequence and for forwarding the data sequence to the decoder.

15           13.    The apparatus of claim 10, wherein said decoder arranges the packets vertically to form columns of symbols, and applies at least one codeword to each of the columns of symbols.

14.    The apparatus of claim 13, wherein for a packet that spans at least one of the columns and that has an error therein, said decoder recovers at least one symbol corresponding to the error using the parity symbols and substitutes the at least one symbol into at least one other of the columns to recover at least one other  
20   symbol.

15.    The apparatus of claim 13, wherein said decoder recovers a packet in at least one of the columns, the packet having an error therein, and substitutes at least one symbol corresponding to the recovered packet for at least one other symbol in at least another one of  
25   the columns to recover at least another packet.